Release notes for ENDF/B Development n-045_Rh_105 evaluation

April 26, 2017

- `psyche` Warnings:

  1. Strength function in URR not in agreement with PSYCHE's expectations
     FILE 2 / SECTION 151 / ISOTOPE MASS = 105. L = 0 / STRENGTH FUNCTION IS 1.11369E-01 / STRENGTH FUNCTION 1.11369E-01 / LIES OUTSIDE LIMITS 1.00000E-05 TO 1.00000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 105. L =  0
                 STRENGTH FUNCTION IS  1.11369E-01
                              STRENGTH FUNCTION 1.11369E-01
... [1 more lines]
```

- `recent` Warnings:

  1. Statistical weight of certain L values were incorrect
     0: RRR goof (a)

```
 Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
 ============================================================================
 Retrieval Criteria-----------        MAT
 File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
 Reactions with No Background-     Output (Resonance Contribution)
... [834 more lines]
```

- `fudge-4.0` Warnings:

  1. Missing a channel with a particular angular momenta combination
     resonances / resolved (Error # 1): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 2.0 and S = 2.0 for "capture"
WARNING: Missing a channel with angular momenta combination L = 0, J = 3.0 and S = 3.0 for "capture"
```

  2. Potential scattering hasn't converted, you need more L's!
     resonances / resolved (Error # 2): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=0 at E=7.5 eV, xs[0]/xs[0]=100.0% > 0.1%
```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.48%
```

- `fudge-4.0` Errors:

  1. The spin statistical weights are off, indicating missing channels
     resonances / resolved / MultiLevel_BreitWigner (Error # 0): badSpinStatisticalWeights

```
WARNING: The spin statical weights for L=0 sums to 0.5625, but should sum to 1.0.  You have too few channels for
```

  2. Calculated and tabulated Q values disagree.
     reaction label 15: n[multiplicity:'2'] + Rh104 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -8500695.629074097 eV vs -8.9791e6 eV!
```

3. Calculated and tabulated Q values disagree.
   reaction label 16: n[multiplicity:'3'] + Rh103 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -15499652.89280701 eV vs -1.59832e7 eV!
```

4. Calculated and tabulated Q values disagree.
   reaction label 17: n + H1 + Ru104 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6579302.23425293 eV vs -7049640. eV!
```

5. Calculated and tabulated Q values disagree.
   reaction label 18: n + H2 + Ru103 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -13256150.7567749 eV vs -1.36532e7 eV!
```

6. Calculated and tabulated Q values disagree.
   reaction label 19: n + H3 + Ru102 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -13230967.64755249 eV vs -1.37051e7 eV!
```

7. Calculated and tabulated Q values disagree.
   reaction label 20: Rh106 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 7053591.754364014 eV vs 6588390. eV!
```

8. Calculated and tabulated Q values disagree.
   reaction label 21: n + He4 + Tc101 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -3468279.86076355 eV vs -3949890. eV!
```

9. Calculated and tabulated Q values disagree.
   reaction label 22: H1 + Ru105_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -669204.690322876 eV vs -1134540. eV!
```

10. Calculated and tabulated Q values disagree.
    reaction label 23: H2 + Ru104_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -4354736.13331604 eV vs -4739520. eV!
```

11. Calculated and tabulated Q values disagree.
    reaction label 24: H3 + Ru103_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -6998917.816162109 eV vs -7468070. eV!
```

12. Calculated and tabulated Q values disagree.
    reaction label 25: He4 + Tc102_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 2832863.541549683 eV vs 2399210. eV!
```

- `njoy2012` Warnings:

1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 16
                         only mf4/mf5 provided
```

2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 17
                         only mf4/mf5 provided
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 22
                         only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 28
                         only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 32
                         only mf4/mf5 provided
```

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (5): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 33
                         only mf4/mf5 provided
```

7. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended

to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (6): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 91
                          only mf4/mf5 provided
```